

THE LANCET

Infectious Diseases

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed.
We post it as supplied by the authors.

Supplement to: Ismail SA, Saliba V, Bernal JL, Ramsay ME, Ladhani SN. SARS-CoV-2 infection and transmission in educational settings: a prospective, cross-sectional analysis of infection clusters and outbreaks in England. *Lancet Infect Dis* 2020; published online Dec 8. [https://doi.org/10.1016/S1473-3099\(20\)30882-3](https://doi.org/10.1016/S1473-3099(20)30882-3).

SUPPLEMENTARY MATERIAL

Figure S1a: Trend in the number of open educational settings of different types for the period 01 June-17 July 2020.....	2
Figure S1b: Trends in attendance by children at educational settings in England for the period 01 June-17 July 2020	3
Figure S2a: Trends in the proportion of open educational settings of different types for the period 01 June-17 July 2020	4
Figure S2b: Trends in proportion of children attending open educational settings in England for the period 01 June-17 July 2020	5
Table S3: Summary of activity in educational during and after the COVID-19 lockdown in England	6
Table S4. Breakdown of demographic characteristics of COVID-19 cases in students and staff attending an educational setting during the summer half-term (June to mid-July 2020) in England, case numbers and clinical outcomes.....	7
Figure S5: Regional distribution of single confirmed cases, co-primary cases (clusters) and confirmed outbreaks across England, June 2020.....	8
Figure S6: Number of secondary cases for confirmed outbreaks in educational settings in England in June-July 2020, by age of the index case	9
Table S7: Summary of wider testing for SARS-CoV-2 in selected educational settings, June-July 2020, England	10
Table S8: STROBE statement checklist for cross-sectional studies	11

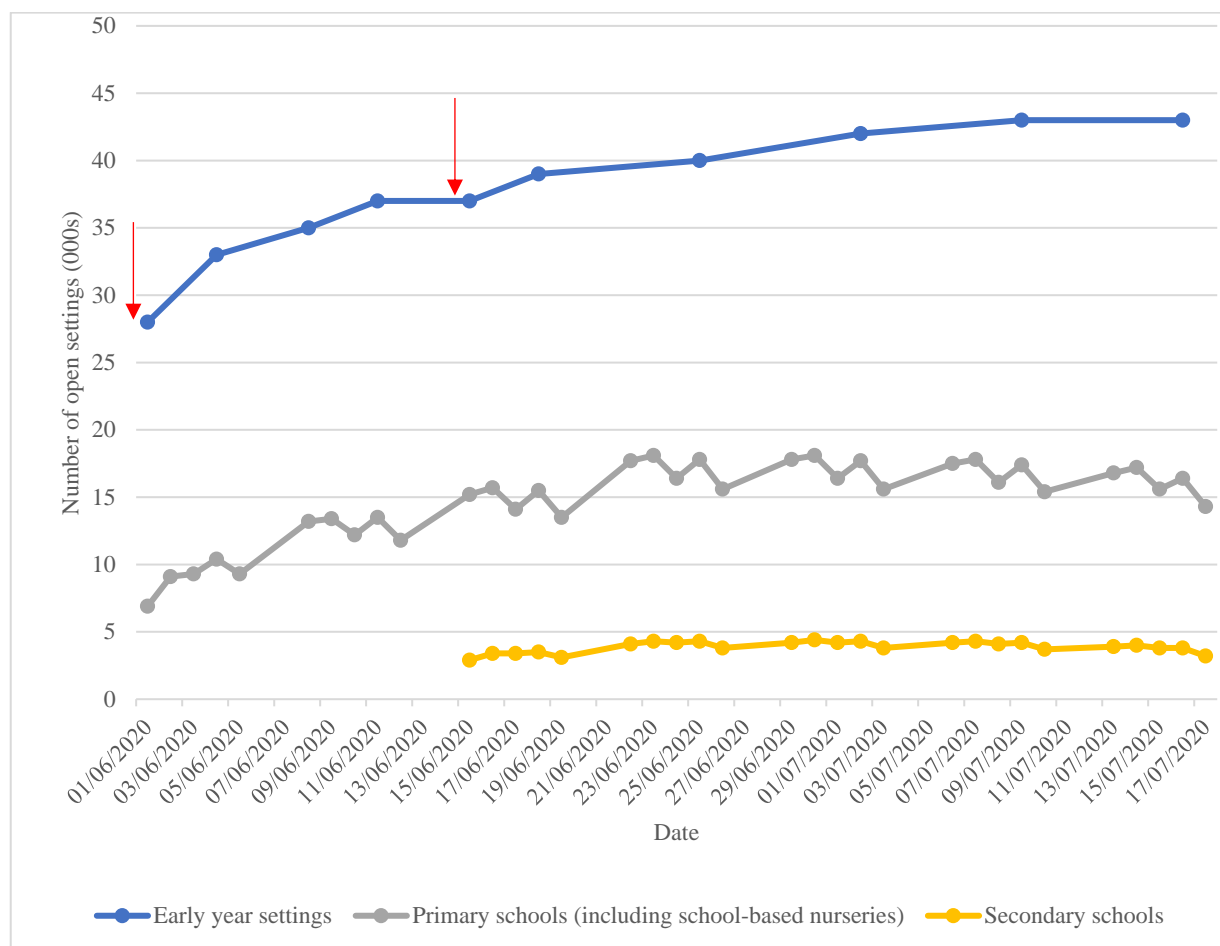


Figure S1a: Trend in the number of open educational settings of different types for the period 01 June-17 July 2020. Data in the series “early years settings” are drawn from a Local Authority survey which spans both school- and non-school based early years settings (nurseries, predominantly). Data in the series “nursery” refer to attendance only at school-based nurseries and are drawn from a DfE survey of school-based settings nationally¹¹. Vertical red arrows correspond to major points of re-opening by year group – i.e. nursery, reception, year 1 and year 6 on 1st June; years 10 and 12 on 15th June.

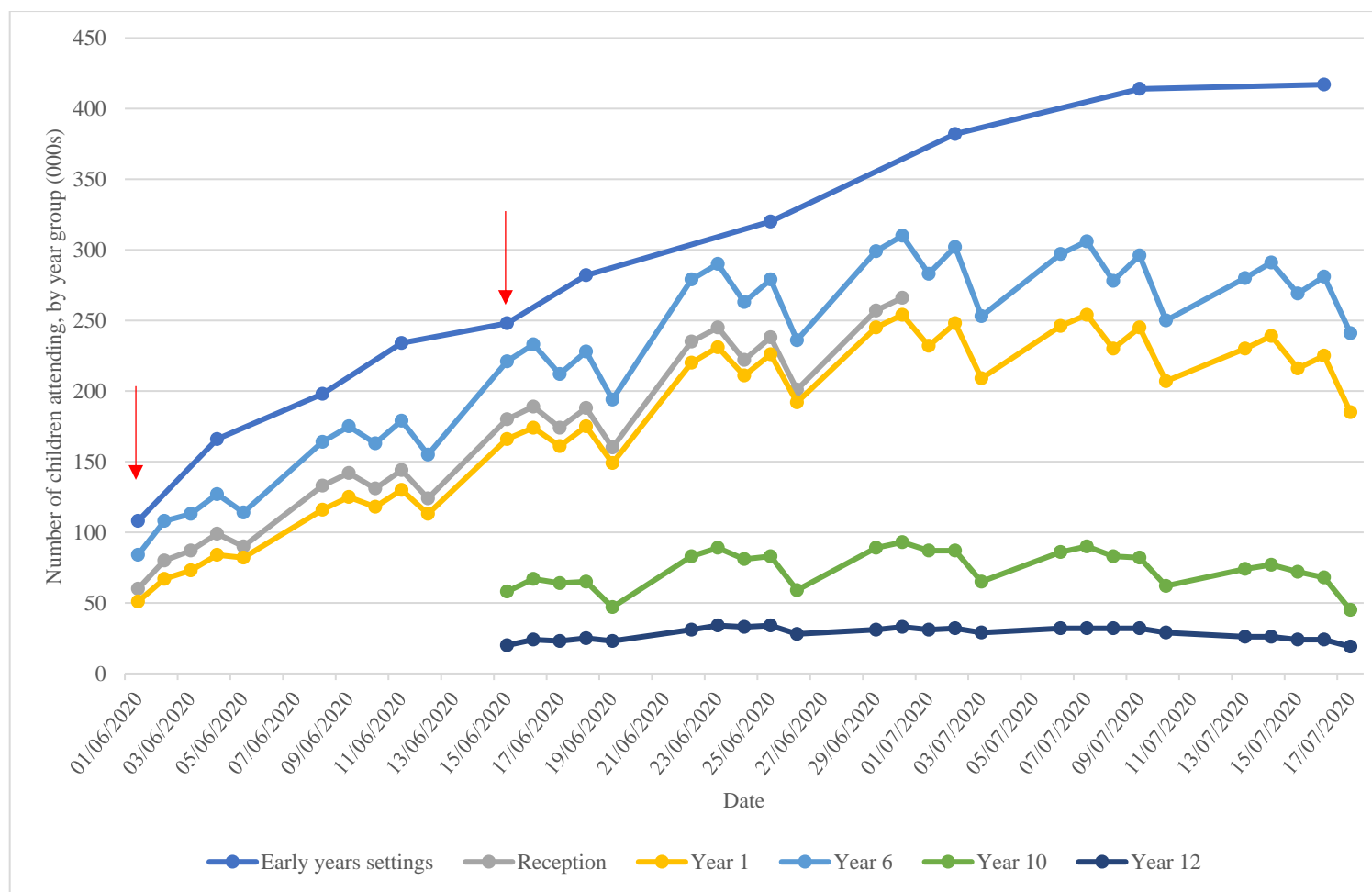


Figure S1b: Trends in attendance by children at educational settings in England for the period 01 June-17 July 2020. Data in the series “early years settings” are drawn from a Local Authority survey which spans both school- and non-school based early years settings (nurseries, predominantly). Data in the series “nursery” refer to attendance only at school-based nurseries and are drawn from a DfE survey of school-based settings nationally.¹¹ Vertical red arrows correspond to major points of re-opening by year group – i.e. nursery, reception, year 1 and year 6 on 1st June; years 10 and 12 on 15th June.

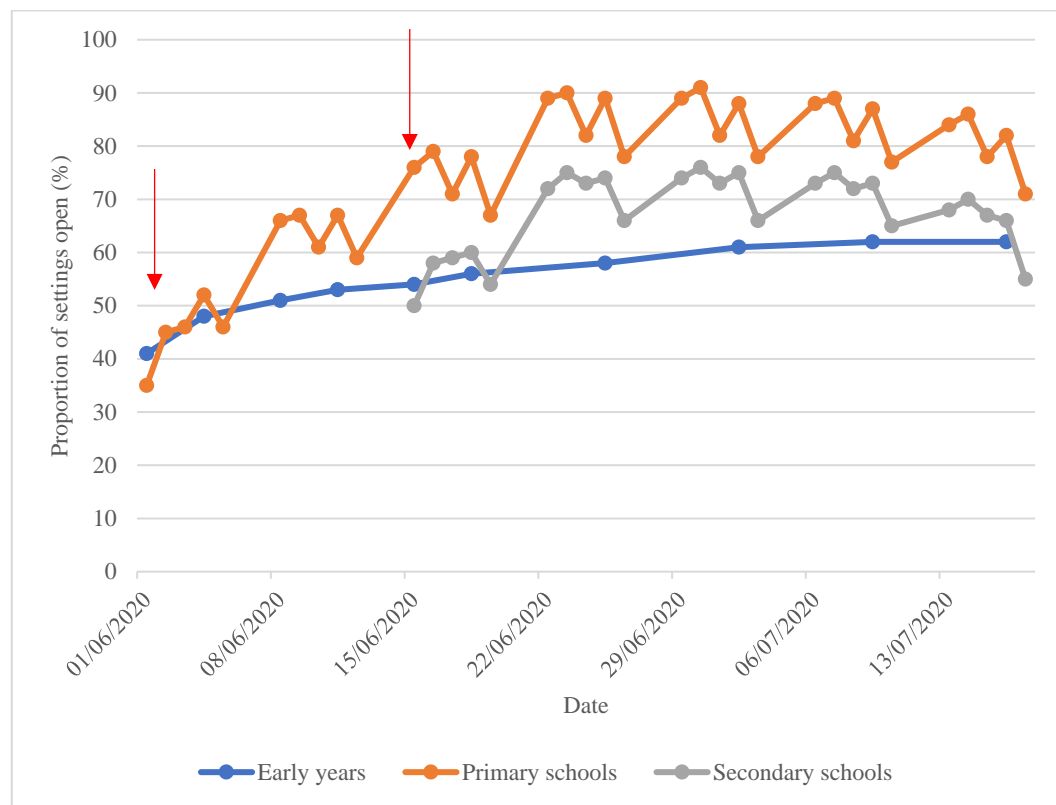


Figure S2a: Trends in the proportion of open educational settings of different types for the period 01 June-17 July 2020.

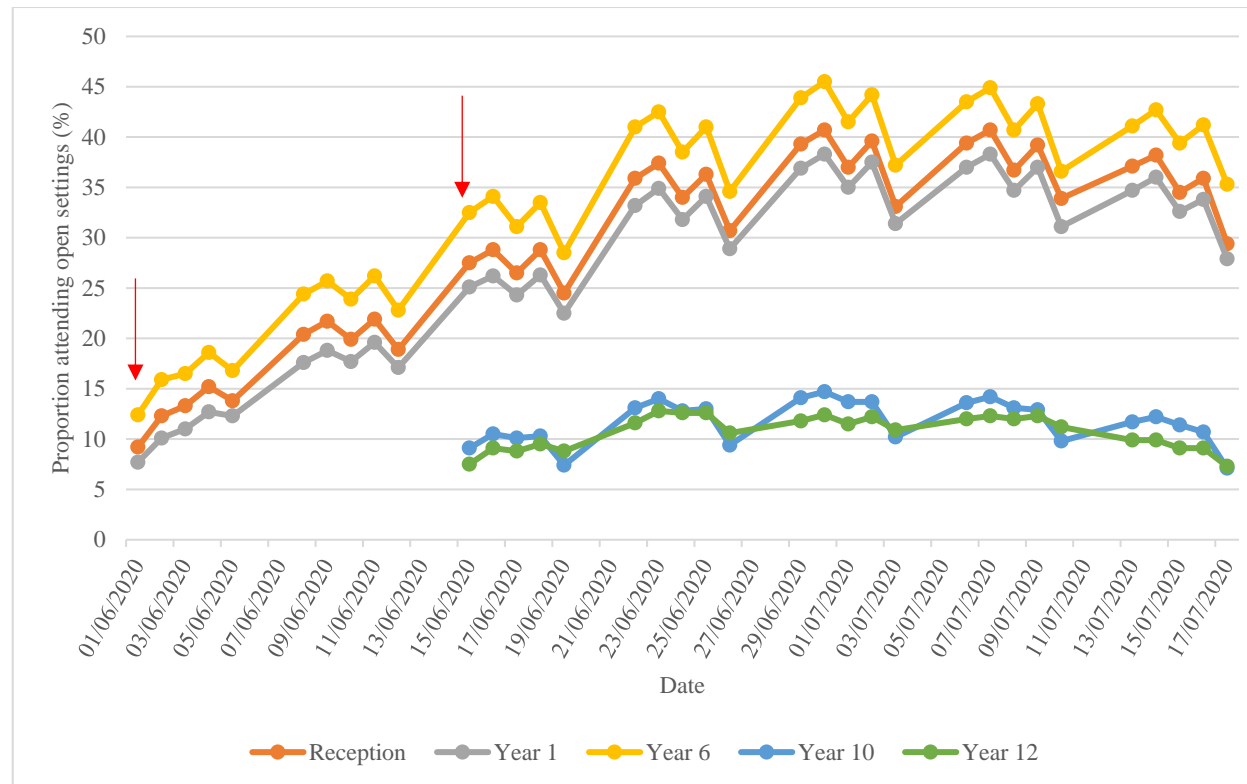


Figure S2b: Trends in proportion of children attending open educational settings in England for the period 01 June-17 July 2020. Data span nursery, reception, year 1, year 6, year 10 and year 12 but are not available for early years settings during this period.

Table S3: Summary of activity in educational during and after the COVID-19 lockdown in England

Educational Settings	COVID-19 RESPONSE IN ENGLAND	Numbers and proportions attending
School attendance for priority groups during the lockdown	<ul style="list-style-type: none"> On 20 March 2020, the government asked educational settings to close to all children except priority groups: children of critical workers and vulnerable children in England Around 80% of schools and colleges were open to priority groups which remained broadly stable 	23 March: 330,000 (4% of children) attending 22,900 settings 13 April: 36,000 (0.4% of children) attending 9,400 settings 29 May: 103,000 (1.1% of children) attending 12,300 settings
Early Years	<ul style="list-style-type: none"> Early years settings began welcoming back all children from 01 June 2020. The number of educational settings increased from 28,000 (41% of settings) on 01 June 2020 to 43,000 (62% of settings) by the time the last data collection before the end of the summer half-term occurred on 16 July 2020 By 16 July, 417,000 children were attending early years setting – about 25% of the number of children who usually attend in term time. 	04 June: 183,000 students 16 July: 417,000 students
Primary schools	<ul style="list-style-type: none"> From 01 June, primary schools welcomed back children in nursery, reception, year 1 and year 6, alongside children from priority groups in all years. Around 35% of primary schools opened to at least one of these year groups on 01 June, increasing to 91% by 30 June before steadily declining again to 71% by 17 July 2020. The daily attendance rate of pupils in reception, year 1 and year 6 increased each week from around 10% on 1 June to around 42% on 30 June, and then remained broadly stable. 	Reception: 01 June: 60,000 (9% of students) 17 July: 193,000 (29% of students) Year 1: 01 June: 51,000 (8% of students) 17 July: 185,000 (30% of students) Year 6: 01 June: 84,000 (12% of students) 17 July: 241,000 (35% of students)
Secondary schools and colleges	<ul style="list-style-type: none"> Secondary schools, sixth form and further education colleges opened to years 10 and 12 from 15 June alongside full-time provision for priority children. Around 50% of secondary schools and colleges opened on 15 June, increasing to 76% by 30 June, and then declining to 55% by 17 July. Daily attendance in year 10 and year 12 (excluding colleges) remained fairly stable at around 11-12% of students throughout this period. National guidance restricted attendance to a quarter of the year 10 and year 12 cohort at any one time 	Year 10: 15 June: 58,000 (9% of students) 17 July: 45,000 (7% of students) Year 12: 15 June: 20,000 (8% of students) 17 July: 19,000 (7% of students)

Data summarised from: <https://explore-education-statistics.service.gov.uk/find-statistics/attendance-in-education-and-early-years-settings-during-the-coronavirus-covid-19-outbreak>

Table S4. Breakdown of demographic characteristics of COVID-19 cases in students and staff attending an educational setting during the summer half-term (June to mid-July 2020) in England, case numbers and clinical outcomes. Figures for primary schools, secondary schools and those for mixed age groups (*) provide aggregate numbers for both mainstream and SEND educational settings in each category (as for tables 1 and 2 in the main paper).

	Sex		Age band						Case classification			Clinical outcomes		
	M	F	0-4	5-9	10-18	19-39	40-59	60+	Single cases	Co-primary cases	Outbreak cases	Hospitalised	ITU admission	Death
Students														
Early years settings	25 (57%)	19 (43%)	41 (93%)	3 (7%)	0	..	..	..	13 (30%)	6 (14%)	25 (57%)	0	0	0
Primary schools*	39 (54%)	33 (46%)	8 (11%)	47 (65%)	17 (24%)	..	..	..	34 (47%)	13 (18%)	25 (35%)	0	0	0
Secondary schools*	8 (66%)	4 (33%)	0	0	12 (100%)	..	..	..	6 (50%)	0	6 (50%)	0	0	0
Schools for mixed age groups*	1 (50%)	1 (50%)	0	1 (50%)	1 (50%)	..	..	..	2 (100%)	0	0	0	0	0
Staff														
Early years	0	51 (100%)	..	..	2 (4%)	27 (53%)	22 (43%)	0	8 (16%)	1 (2%)	42 (82%)	1 (2%)	0	0
Primary schools*	16 (15%)	91 (85%)	..	..	1 (1%)	41 (38%)	62 (58%)	3 (3%)	35 (33%)	0	72 (67%)	2 (2%)	2 (2%)	0
Secondary schools*	9 (43%)	12 (57%)	..	..	..	7 (33%)	12 (57%)	2 (10%)	5 (24%)	0	16 (76%)	1 (8%)	1 (8%)	1 (8%)
Schools for mixed age groups*	7 (21%)	27 (79%)	..	..	..	19 (56%)	15 (44%)	0	10 (29%)	0	24 (71%)	1 (3%)	0	0

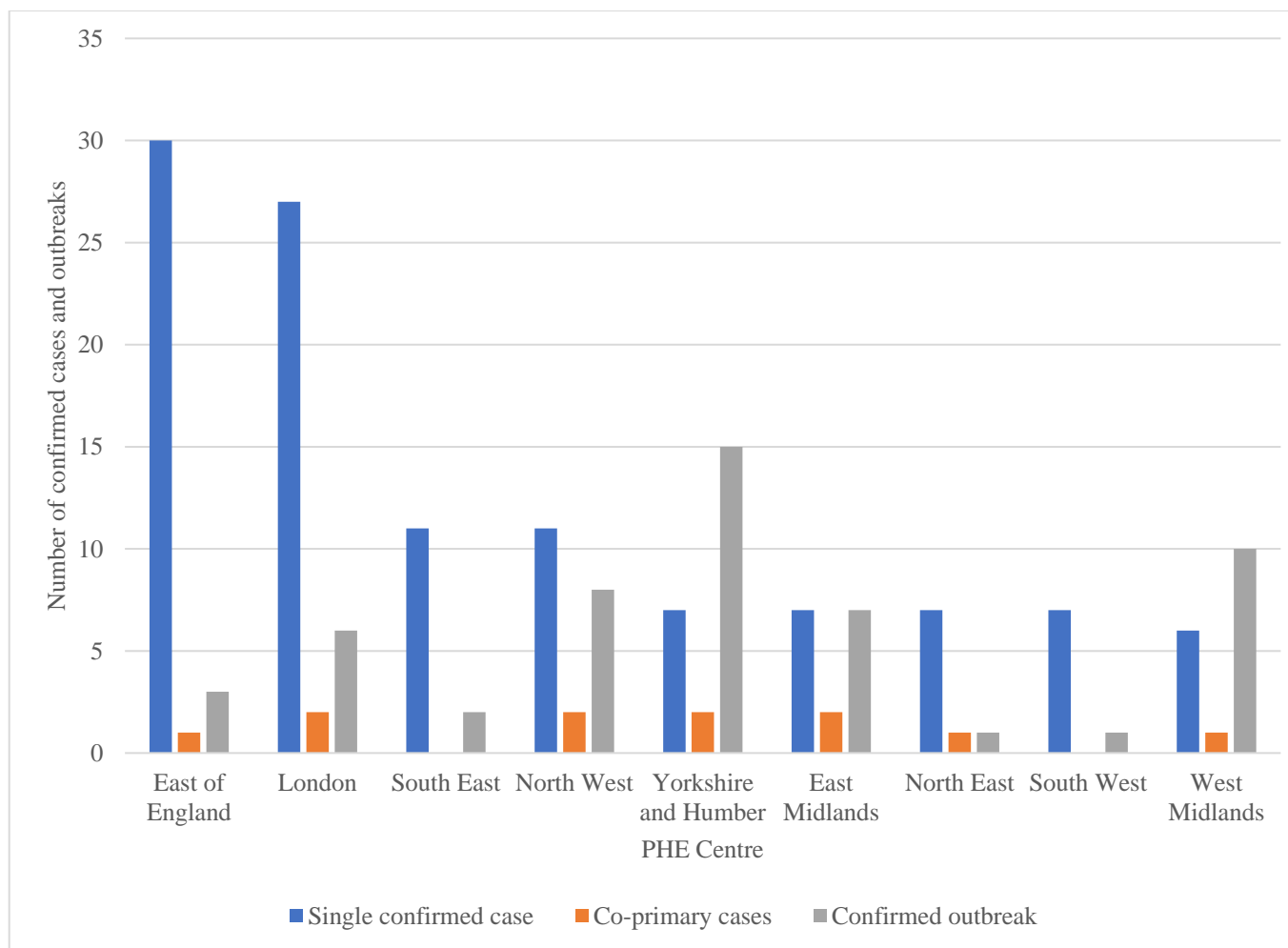


Figure S5: Regional distribution of single confirmed cases, co-primary cases (clusters) and confirmed outbreaks across England, June 2020.

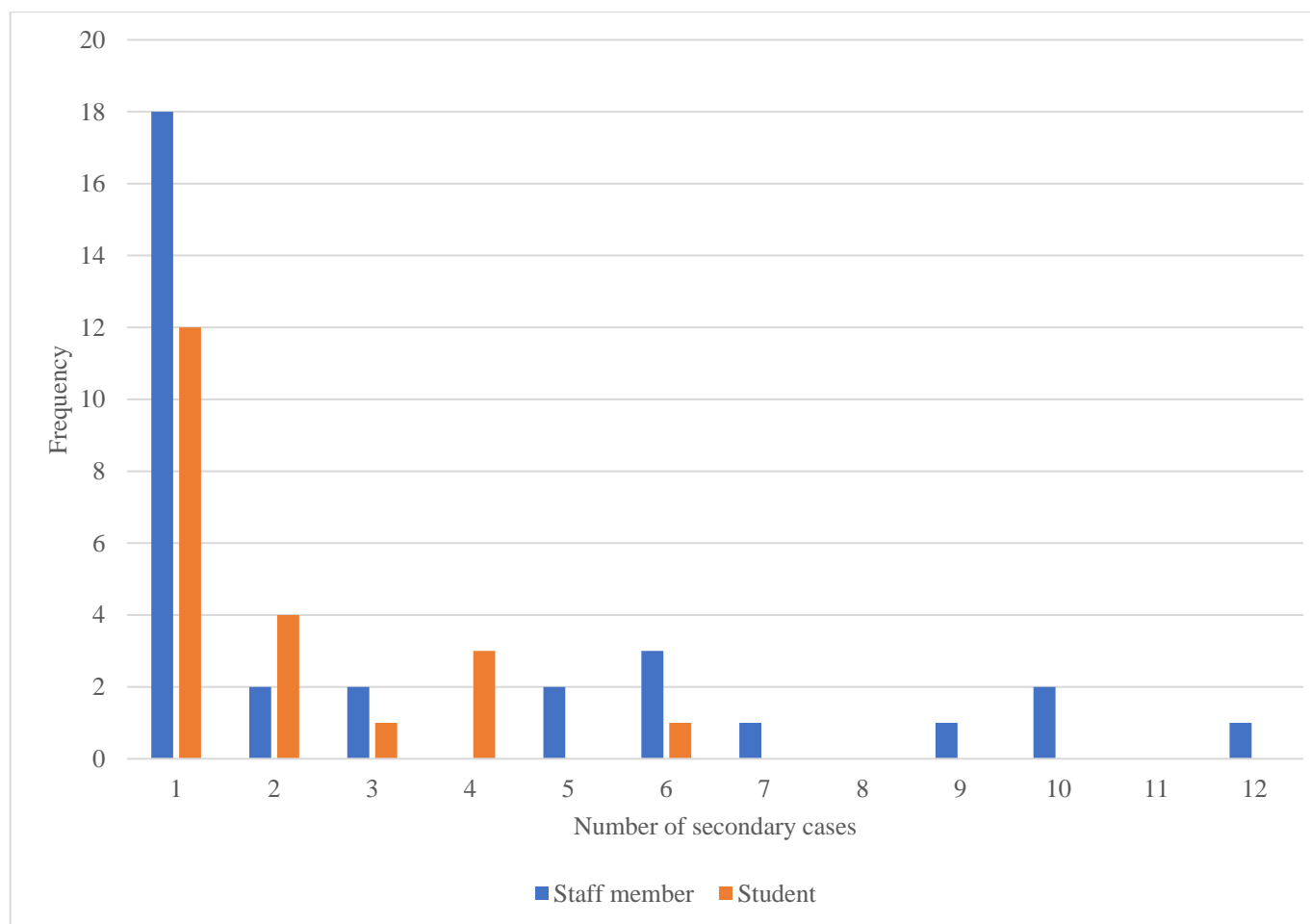


Figure S6: Number of secondary cases for confirmed outbreaks in educational settings in England in June-July 2020, by age of the index case. The median number of secondary cases for both staff and student index cases was 1, with an IQR of 1-2 for student index cases, and 1-5 for staff members.

Region in England	Description of the situation	Children/ Staff attending	School closed?	Teachers and other staff			Students			Overall assessment
				Exposed	Positive	Inconclusive/ Unknown	Exposed	Positive	Inconclusive/ Unknown	
Yorkshire and Humber	<ul style="list-style-type: none"> • 9 confirmed cases (8 staff, 1 child) in a secondary school for children with SEND; only 1 staff member was symptomatic. • Wider swabbing undertaken because of vulnerability of the population. 	16/24	No	22	6/18	0	16	1/12	0	Confirmed outbreak mainly affecting staff in a special needs school, with evidence of transmission to a child.
East of England	<ul style="list-style-type: none"> • 13 confirmed cases (9 pupils, 4 staff) in a primary school. Staff member was the index case, 2 children then became symptomatic; infection source not known. • Partner of index case then tested positive. • 4 bubbles in school, 2 affected. Bubble 1: 20 children, 3 staff; Bubble 2: 17 children. Only known point of contact between the two bubbles was shared pupil washroom facilities. • Wider swabbing for all staff, students and household members: 165 tested; 9/38 children, 4/12 staff and 10/112 household members positive 	64/12	Yes	10	4/12	0	64	9/38	3	Outbreak in a primary school, with staff member as index case. Evidence of wider transmission across 2 bubbles and within households.
Yorkshire and Humber	<ul style="list-style-type: none"> • 13 confirmed cases (3 pupils, 10 staff) in a primary school; 2 teachers (partners) were index cases. Infection source not known • 2 main bubbles: Bubble 1: lunchtime supervision (14 pupils, 5 staff). Bubble 2: breakfast club (9 pupils, 1 staff) • Wider testing because of large contact potential: 167 staff and pupils attending were tested. 	100/30	Yes	6	10/74	2	23	3/93	15	Primary school outbreak involving staff and pupils, originally linked to a household cluster; evidence of wider transmission across bubbles.
West Midlands	<ul style="list-style-type: none"> • 2 confirmed cases in a child and a member of staff at a primary school. • The child was part of a bubble with 15 other pupils and 3 members of staff. • Wider testing was performed because of large contact potential: 104 staff and pupils were tested. 	70/54	Yes	3	0/52	0	15	0/52	0	Confirmed outbreak with evidence of potential transmission from a child to a teacher but no evidence of wider transmission.
West Midlands	<ul style="list-style-type: none"> • 10 confirmed cases among staff members in a residential and educational facility for children with SEND. • Wider testing carried out because of the vulnerability of the attending children identified a further 7 positive staff cases, among a total of 164 staff members swabbed. 	26/190	No	190	7/164	5	26	0/1	0	Confirmed outbreak focused on staff members working at this school.
West Midlands	<ul style="list-style-type: none"> • 2 confirmed cases in staff members at a school for children with SEND. Wider testing was performed because of the vulnerability of the student group. • 2 bubbles affected: bubble 1 – 6 staff and 6 pupils, all of whom tested negative; bubble 2 – 4 children and 10 staff. 	40/43	Yes	16	0/38	0	10	0/15	0	Confirmed outbreak focused on staff members working at this school.

Table S7: Summary of wider testing for SARS-CoV-2 in selected educational settings, June-July 2020, England

Table S8: STROBE statement checklist for cross-sectional studies

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	1-2
Objectives	3	State specific objectives, including any prespecified hypotheses	2
Methods			
Study design	4	Present key elements of study design early in the paper	1,2
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	2-3
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	2
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	2-3
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	2-3
Bias	9	Describe any efforts to address potential sources of bias	2-3
Study size	10	Explain how the study size was arrived at	2-3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	3
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	3
		(b) Describe any methods used to examine subgroups and interactions	N/A
		(c) Explain how missing data were addressed	3
		(d) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(e) Describe any sensitivity analyses	N/A
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	3-4, figure 2
		(b) Give reasons for non-participation at each stage	3-4, figure 2
		(c) Consider use of a flow diagram	Figure 2
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Supplement table S4
		(b) Indicate number of participants with missing data for each variable of interest	N/A
Outcome data	15*	Report numbers of outcome events or summary measures	3-6
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	4, table 1, table 2
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	6-8
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	8-9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	9-10
Generalisability	21	Discuss the generalisability (external validity) of the study results	8-10
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	3

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.